

REMARKS

Claims 5 and 8-14 are now pending in the application. By this paper, Claims 5, 8, and 9 have been amended, Claim 7 has been cancelled without prejudice or disclaimer of the subject matter contained therein, and Claim 14 has been added. The basis for these amendments and new claim can be found throughout the specification, claims, and drawings originally filed. No new matter has been added. The preceding amendments and the following remarks are believed to be fully responsive to the outstanding Office Action and are believed to place the application in condition for allowance.

The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 5-13 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Abbott et al. (U.S. Pat. No. 6,337,445).

Claims 5-13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Gaynes et al. (U.S. Pat. No. 6,165,885).

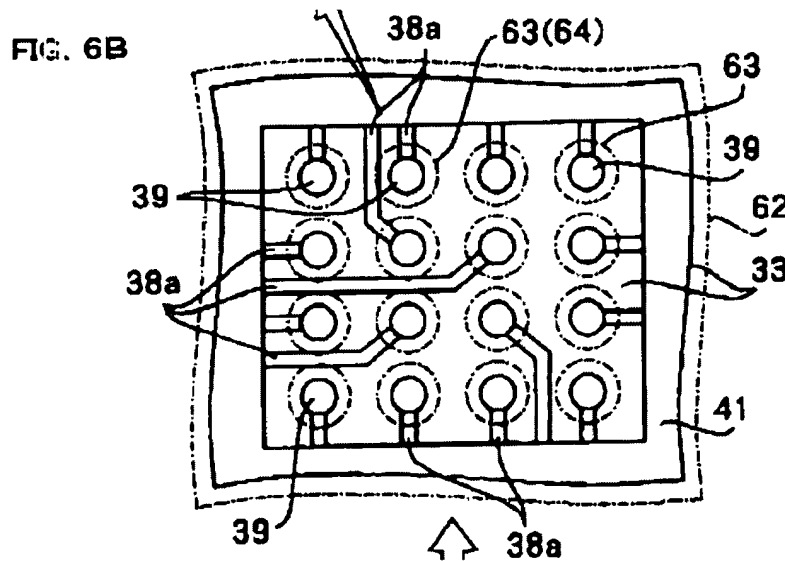
Claims 5-9 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Grigg (U.S. Pat. No. 6,622,380).

These rejections are respectfully traversed.

Independent Claim 5 calls for a wiring board production method including forming a pair of substrate terminals on a substrate, forming a conductive region between the pair of substrate terminals, and applying solder continuously across one of the substrate

terminals and the conductive region to entirely cover one of the substrate terminals and at least partially cover a portion of the conductive region. See Specification at pg. 17, Paragraphs [0079]-[0081] and FIGS. 3, 4A, and 6B. In addition, independent Claim 5 calls for mounting an IC package having terminals and solder balls connected to the terminals on the substrate so that the solder balls of the IC package are aligned with corresponding substrate terminals through the applied solder, melting the applied solder and the solder balls in a reflow process after mounting the IC package, and performing the reflow process so as to divide the applied solder between the one substrate terminal and the portion of the conductive region. See Specification at pg. 17, Paragraph [0080] and FIG. 6B.

In this manner, the present invention calls for a wiring board (3) including an IC package (36) having a series of terminals (39) and a series of wiring lines (38a, 38b). See Specification at pg. 16, Paragraph [0077] and FIG. 6B. The terminals are soldered to the wiring lines using a solder. See Specification at pg. 16, Paragraph [0078]. A mask (62) is applied to the wiring board having openings (63) to control application of the solder. See Specification at pg. 16, Paragraph [0078]. Each opening formed in the mask is larger than each of the terminals such that each terminal is fully exposed and a “conductive region” generally surrounding each terminal is exposed. See FIG. 6B, reproduced below in relevant part. When solder is placed on the mask, the solder completely covers the terminals and also coats the wiring line 38a disposed within the conductive region. See Specification at pg. 17, Paragraph [0080].



When the solder contacts the wiring line and the terminals, the wiring line and the terminals are short-circuited by the solder. See Specification at pg. 17, Paragraph [0081]. The resulting soldered construction is not suitable for practical use. However, a reflow process (step P8 of FIG. 5) follows the application of solder to melt the solder into two portions (64a, 64b). See Specification at pg. 17, Paragraph [0081] and pg. 18, Paragraph [0082]. The two portions prevent short-circuiting between the terminals and the wiring lines as one portion (64a) moves towards the terminal and the other portion (64b) moves toward the wiring line. See Specification at pg. 18, Paragraph [0082].

The cited art of record fails to teach or suggest such a relationship. Specifically, Abbott teaches a connection structure (800) having a composite bump (805) attached electrically and mechanically to an integrated circuit or package by solder (808). See Abbott at Col. 7, Ins. 33-41 and FIG. 6. Abbott fails to teach a mask having oversized openings to allow the solder to cover both a terminal and a wiring layer. In addition, Abbott fails to teach a reflow process that separates the solder into two portions with one portion moving towards the terminal and the other portion moving towards the

wiring line. In this manner, Abbott fails to teach each and every element of the claimed invention.

Gaynes teaches a method of forming solder balls onto an IC. See Gaynes at Col. 7, Ins. 54-67 and Col. 8, Ins. 1-2. Gaynes teaches applying HMT solder by dry deposition over a photo-patterned resist or through a mask. See Gaynes at Col. 20, Ins. 17-22. The deposited solder is reflowed to form bumps or balls of solder. See Gaynes at Col. 20, Ins. 24-25. Gaynes fails to teach a mask having oversized openings to allow the solder to cover both a terminal and a wiring layer. In addition, Gaynes fails to teach a reflow process that separates the solder into two portions with one portion moving towards the terminal and the other portion moving towards the wiring line. In this manner, Gaynes fails to teach each and every element of the claimed invention.

Grigg teaches applying a solder mask layer (30) to a substrate (6) of a microelectronic die (i.e., an IC package (10)), whereby the solder mask layer electrically isolates traces (22) and ball pads (2) from each other. See Grigg at Col. 4, Ins. 30-38, Col. 4, Ins. 36-38, and FIG. 2. In this manner, Grigg teaches isolating the traces from the ball pads through use of a mask rather than by separating the solder into two portions through a reflow process. In addition, Grigg fails to teach a mask having oversized openings to allow solder to cover both a terminal and a wiring layer. In this manner, Gaynes fails to teach each and every element of the claimed invention.

Because Abbott, Gaynes, and Grigg each fail to teach a mask having oversized openings to allow solder to cover both a terminal and a wiring layer, and further, because Abbott, Gaynes, and Grigg each fail to teach a reflow process that separates the solder into two portions with one portion moving towards the terminal and the other

portion moving towards the wiring line, Applicant respectfully submits that Abbott, Gaynes, and Grigg fails to teach each and every element of the present invention. Accordingly, Applicant respectfully submits that independent Claim 5, as well as Claims 8-13, dependent therefrom, are in condition for allowance. Therefore, reconsideration and withdrawal of the rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 10-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Grigg (U.S. Pat. No. 6,622,380) in view of Ishibashi (U.S. Pat. No. 5,931,577).

This rejection is respectfully traversed.

Independent Claim 5 is believed to be in condition for allowance in light of the remarks contained above. Because Claims 10-13 depend from independent Claim 5, dependant Claims 10-13 should similarly be in a condition for allowance for at least the same reasons. Therefore, reconsideration and withdrawal of the rejection is respectfully requested.

NEW CLAIM

Claim 14 is added for consideration. Claim 14 depends from independent Claim 5, which is believed to be in condition for allowance in light of the foregoing remarks. Claim 14 is therefore believed to be in condition for allowance.

CONCLUSION

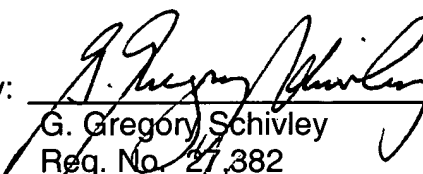
It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated:

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